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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/767,358	01/28/2004	Avishay Bartov	PDC/WF	4882

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EXAMINER

WHITMORE, STACY

ART UNIT	PAPER NUMBER
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2825

DATE MAILED: 10/18/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/767,358	Applicant(s) BARTOV, AVISHAY	
	Examiner Stacy A. Whitmore	Art Unit 2825	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 8/7/2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-33 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-33 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 January 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Applicant's arguments filed August 7, 2006, with respect to claims 1-28, and 31-33 have been fully considered but they are not persuasive.
2. Applicant's arguments with respect to claims 29-30 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1-6, 8-9, 11-16, 18-28, and 31-33 are rejected under 35 U.S.C. 102(e) as being anticipated by Bareket (US Patent 6,614,520).
4. As for the claims, Bareket discloses the invention as claimed, including:
 1. A method of controlling the current condition of a reticle, the method comprising: processing and analyzing test data indicative of a test pattern produced

on an article using the reticle when in the current condition, and reference data indicative of a reference pattern previously produced on an identical reference article using said reticle when considered to be of a satisfied condition, and generating output data indicative of the current condition of said reticle [abstract; col. 7-8, baseline image generation, compaction, comparison sections; col. 11, lines 32-46];

31. A system for use in controlling the condition of a reticle, the system comprising:

(a) a measuring unit configured for irradiating at least a portion of a patterned article, detecting a radiation response of the sample, and obtaining measured data indicative thereof;

(b) a control unit configured for data communication with the measuring unit, so as to be responsive to the measured data indicative of the radiation response of the article corresponding to a current condition of said reticle, to analyze said measured data using certain reference data, and generate output data indicative of the data analysis results, said reference data being indicative of the radiation response of at least a portion of a reference pattern produced on

an identical article using said reticle, when considered to be of a satisfied condition [abstract; col. 7-8, baseline image generation, compaction, comparison sections; col. 11, lines 32-46; col. 9, lines 1-15];

32. A program storage device readable by machine, tangibly embodying a program of instructions executable by the machine to perform method steps of controlling the current condition of a reticle, the method comprising: processing and analyzing test data indicative of a test pattern, produced by the reticle when in the current condition on an article, and reference data indicative a reference pattern previously produced on an identical article by using said reticle, when considered to be of a satisfied condition, and generating output data indicative of the current condition of said reticle [abstract; col. 7-8, baseline image generation, compaction, comparison sections; col. 11, lines 32-46; col. 9, lines 1-15];

33. A computer program product comprising a computer useable medium having computer readable program code embodied therein of controlling the current condition

of a reticle, the computer program product comprising a data processing entity for processing and analyzing data indicative of a test pattern, produced by the reticle when in the current condition on an article, and data indicative of a reference pattern previously produced on a similar article by using said reticle, when considered to be of a satisfied condition, and generating output data indicative of the current quality condition of said reticle [abstract; col. 7-8, baseline image generation, compaction, comparison sections; col. 11, lines 32-46; col. 9, lines 1-15];

2. The method of Claim 1, wherein said processing and analyzing includes processing at least one of the reference and test data to obtain optimized data indicative of the pattern substantially free of effects caused by defects other than those caused by said reticle [abstract; col. 7-8, baseline image generation, compaction, comparison sections; col. 11, lines 32-46; col. 1, lines 40-48];

3. The method of Claim 2, wherein said effects, caused by the defects other than those caused by the reticle, are identified as effects randomly appearing in the pattern indicative data [col. 1, lines 40-48];

4. The method of Claim 1, wherein said test pattern is produced on a test article having a layer material structure identical to that of the reference article [col. 3, lines 15-28];

5. The method of Claim 1, wherein the reference pattern and the test pattern are produced on different areas of the same reference article [abstract];

6. The method of Claim 1, wherein the reference pattern and the test pattern are produced in, respectively, reference and test areas each having a single-layer structure [abstract; col. 1];

8. The method of Claim 1, wherein the data indicative of the pattern is obtained using bright field inspection of at least a portion of the pattern [col. 5-6];

9. The method of Claim 1, wherein the data indicative of the pattern is obtained using dark field inspection of at least a portion of the pattern [col. 5-6];

11. The method of Claim 1, wherein the data indicative of the pattern is obtained by applying optical critical dimension measurements to at least a portion of the pattern [col. 7, lines 52-60; col. 8, lines 32-37];

12. The method of Claim 1, wherein the data indicative of the pattern includes several

similar, periodically appearing, pattern features [abstract; col. 7-8, baseline image generation, compaction, comparison sections; col. 11, lines 32-46; col. 9, lines 1-15];
13. The method of Claim 12, comprising applying image processing to the data indicative of the pattern to correct for defects in an image of the pattern feature [abstract; col. 7-8, baseline image generation, compaction, comparison sections; col. 11, lines 32-46; col. 9, lines 1-15];

14. The method of Claim 13, wherein said correcting comprises dividing the image of the defective pattern feature into image parts and replacing the defective image part by a corresponding image part of an image of another pattern feature [col. 9-10, training algorithm section, new image];

15. The method of Claim 1, comprising, upon obtaining the reference data, storing the reference data to be used later one for the data processing analyzing when controlling of the current condition of the reticle is needed [fig. 2];

16. The method of Claim 1, comprising, upon producing the reference pattern, storing the reference pattern to be used later one to provide said reference data when controlling of the current condition of the reticle is needed [fig. 2];

18. The method of Claim 1, for controlling the condition of the reticle prior to carrying out an etching stage of a lithography process [abstract; col. 7-8, baseline image generation, compaction, comparison sections; col. 11, lines 32-46; col. 9, lines 1-15];

19. The method of Claim 1, for controlling the reticle used for semiconductor wafers production [col. 11, line 25];

20. The method of Claim 19, wherein the pattern is produced on a bare wafer [abstract; col. 7-8, baseline image generation, compaction, comparison sections; col. 11, lines 32-46; col. 9, lines 1-15];

21. The method of Claim 19, wherein the test pattern is produced on a wafer having a layer material structure similar to that of the production wafer [abstract; col. 7-8, baseline image generation, compaction, comparison sections; col. 11, lines 32-46; col. 9, lines 1-15];

22. The method of Claim 19, wherein said test pattern is produced on the production wafer [abstract; col. 7-8, baseline image generation, compaction, comparison sections;

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col. 11, lines 32-46; col. 9, lines 1-15];

23. The method of Claim 19, wherein the data indicative of the pattern is indicative of an image of several dies on the wafer [abstract; col. 7-8, baseline image generation, compaction, comparison sections; col. 11, lines 32-46; col. 9, lines 1-15];

24. The method of Claim 23, comprising die-to-die image processing [col. 2, lines 29-30];

25. The method of Claim 23, comprising applying image processing to correct for defects in the die image [col. 3];

26. The method of Claim 25, wherein said correcting comprises dividing the image of the defective die into image parts and replacing the defective image part by a corresponding image part of another die image [col. 7-8; col. 9-10, training algorithm section, new image];

27. The method of Claim 19, comprising, upon providing the reference data, storing said reference data to be used later on for the data processing and analyzing when controlling the current condition of the reticle is needed [fig. 2];

28. The method of Claim 19, comprising, upon producing the reference pattern, storing said reference pattern to be used later on to provide said reference data when controlling the current condition of the reticle is needed [fig. 2].

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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5. Claims 29-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bareket (US Patent 6,614,520) in view of Hechtl (US Patent Application Publication 2004/0066963).

6. As for the claims, Bareket discloses the invention substantially as claimed, including

29. A method of controlling the condition of a reticle, the method comprising: using said reticle when in a satisfied quality condition thereof to produce a reference pattern, and using said reticle when in a current condition thereof a certain time period thereafter; providing first measured data indicative of the reference pattern and providing a second measured data indicative of the test pattern, and analyzing the first and second measured data to generate output data indicative of the current condition of said reticle [abstract; col. 7-8, baseline image generation, compaction, comparison sections; col. 11, lines 32-46];

30. A method of controlling the condition of a reticle, the method comprising: inspecting a reference pattern, using the reticle to be controlled when considered to be of a satisfied condition, said inspecting comprising exposing at least a portion of the reference pattern to incident radiation and obtaining first measured data indicative of the radiation response of said at least portion of the pattern; selectively controlling a current condition of said reticle a certain time period after the production of the reference pattern, said controlling comprising using said reticle to produce a test pattern, exposing at least a portion of said test pattern to said incident radiation and obtaining second measured data indicative of the radiation response of said at least portion of the test pattern; analyzing the first and second measured data to generate output data indicative of the current quality condition of said reticle [abstract; col. 7-8, baseline image generation, compaction, comparison sections; col. 11, lines 32-46; col. 9, lines 1-15];

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Bareket does not specifically disclose that the reference pattern and test pattern are imaged from the production of the image using the reticle to pattern the article.

Hechtl discloses producing both reference and test pattern upon an article using a reticle for the purpose of reticle inspection [abstract, paragraph 0006].

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Bareket and Hechtl because using the method of Hechtl to form patterns on articles to thereby check the reticle for deviations would allow for Bareket's system check for defects caused by apparatus used in the fabrication as well as mask deviations [see Hechtl, paragraph 0006].

7. Claims 7, 10, and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bareket (US Patent 6,614,520) in view of Karklin (US Patent Application Publication 2002/0164064).

8. As for the claims, Bareket discloses the invention substantially as claimed, including:

The method of controlling the current condition of a reticle, wherein the reference pattern and the test pattern are produced in, respectively, reference and test areas, as cited above in the rejection of claim 1.

Bareket does not specifically disclose

The method of Claim 1, a multi-layer stack structure, charged particles beam, and controlling the condition of the reticle after an etching stage of a lithography process

Karklin (US Patent Application Publication 2002/0164064) discloses a multi-layer stack structure, charged particles beam, and controlling the condition of the reticle after an

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etching stage of a lithography process [paragraph 0021; 0081; 0097; 0199; 0206].

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Bareket and Karklin because Karklin's multi layer stack, charged particle beam, and etching step are all part of a normal processing step involved with the manufacture of reticles and wafers and therefore would provide improved defect analyses and control over Bareket's reticle processing system.

9. In the remarks, applicant argues in substance:

A: Bareket does not disclose data indicative of a current pattern produced on an article is compared with data indicative of a reference pattern produced on a reference mask, and that the condition of the reticle is determined not from measurements of the reticle itself, but from measurements of patterns produced on articles using the subject reticle.

Examiner respectfully disagrees for the following reasons:

As to point A: Claims 1 and 31-33 using the claim language data indicative of does not require that reticle is actually used to produce a pattern on another article as argued by applicant, therefore, applicant's arguments with respect to claims 1-28, and 31-33 are not deemed persuasive. With respect to claims 29-30, applicant's claims language with respect to actually producing a pattern on an article other than the reticle are clear, however, applicant's arguments with respect to claims 29-30 are moot under a new rejection.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stacy A. Whitmore whose telephone number is (571) 272-1685. The examiner can normally be reached on Monday-Thursday, alternate Friday 6:30am - 4:00 pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jack Chiang can be reached on (571) 272-7483. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.


Stacy A Whitmore

Primary Examiner

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SAW

October 12, 2006

A handwritten signature in black ink, appearing to read 'SAW', is written over the printed name and title of the examiner.